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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/176,580 10/21/98 SUNDARAM

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EXAMINER

VERBITSKY, G

ART UNIT

PAPER NUMBER

2859

DATE MAILED:

10/15/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/176,580

Applicant(s)
Sundaram et al.

Examiner
Gail Verbitsky

Art Unit
2859



-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Aug 6, 2001

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 2, 4-7, 9-16, 18, 20, 21, and 23-26 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 2, 4-7, 9-16, 18, 20, 21, and 23-26 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3(1 page) 20) ☐ Other: _____

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DETAILED ACTION

Claim Objections

1. Claims 6, 12, 16, 18, 21, 26 are objected to because of the following informalities:

Claim 6: "padsproximate" should be replaced with --pads proximate-- in line 3,

Claim 12: Perhaps applicant should insert --the plurality of thermal transducers comprising-- after "wherein" in line 1 and --, the first and the second thermal transducers-- after "a second thermal transducer" in line 2 in order to clearly describe the invention,

Claims 16, 21, 26: --surface-- should be added after "air bearing",

Claims 18, 21: Perhaps applicant should replace "glide heads" with --glide bodies-- in order to clearly describe the invention . Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "asperity detection system", "trailing edge", "leading edge", "raised portion", "elevated portion", "plurality of glide heads", "recessed ABS", "an asperity detection system", "protective layer" must be shown or the feature(s) canceled from the claim(s) 2, 4-7, 9-16, 18, 20-21, 23-26. No new matter should be entered.

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Specification

3. The disclosure is objected to because of the following informalities: the asperity detection system, raised bearing portion, elevated bearing portion, trailing edge, leading edge, recessed bearing surface, protective layer are not described in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 15-16 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In this case,

Claim 15: "an asperity detection system" makes the claim language confusing because it is not clear what applicant means. Does applicant mean a peak circuitry? Is this a proper interpretation of the invention?

Claims 16 and 26: the claim language is confusing because, according to claim 16, the thermal transducers are deposited onto a raised bearing surface, while according to claim 26, the thermal transducers are deposited onto the surface of the wafer. Clarification is required.

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 2, 4, 11, 14, 15-16, 23, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Boutaghou et al.'184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 and 13 a thermal asperity sensor comprising a slider body 12 having a leading edge A, transducers (magnetoresistive sensors/ MR) 18 spaced apart on rails (elevated bearing surface) 26 with grooves 20 (raised bearing surface) of an air bearing surface 14 ABS (col. 6, lines 6-7 and Fig. 1), a control circuitry for moving a head and lifting it above a disc surface (col. 1, lines 27-30). The leading edge is generally transverse (in this case perpendicular) to the ABS. The ABS also has a recessed surface B (Fig. 13). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a "thermal asperity" on a disc through bond pads (physical contact) or terminals (conductive strips) on a surface of the slider body 12 (col. 3, lines 36-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by known technique from NiFe (col. 3, line 23) by deposition of very thin, as known in the art (col. 4, lines 8-9), layers, thus, constituting a very thin flat (planar) (col. 7, line 20) asperity contacting surface oriented along the ABS.

Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28

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upon which sensor layers 18 are deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the plane of the transducers is oriented along the ABS (not the trailing edge). (The numerals A-B have been added by the Examiner, see attachment to the Office Action).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5-6, 9-10, 16, 18, 21 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou et al. '184 [hereinafter Boutaghou].

Boutaghou discloses in Figs. 1-4 and 13 a thermal asperity sensor comprising a slider body 12 having a leading edge A, transducers (magnetoresistive sensors/ MR) 18 spaced apart on rails (elevated bearing surface) 26 with grooves 20 (raised bearing surface) of an air bearing surface 14 ABS (col. 6, lines 6-7 and Fig. 1), a control circuitry for moving a head and lifting it above a disc surface (col. 1, lines 27-30). The leading edge is generally transverse (in this case perpendicular) to the ABS. The ABS also has a recessed surface B (Fig. 13). The transducers 18 are coupled to a peak circuitry 25 detecting a voltage spike indicative of a "thermal asperity" on a

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disc through bond pads (physical contact) or terminals (conductive strips) on a surface of the slider body 12 (col. 3, lines 36-38 and 56-58) and being capable to detect PZT excitation or other signals (col. 3, lines 43-45). The MR are fabricated by known technique from NiFe (col. 3, line 23) by deposition of very thin, as known in the art (col. 4, lines 8-9), layers, thus, constituting a very thin flat (planar) (col. 7, line 20) asperity contacting surface oriented along the ABS.

Boutaghou also states that, during the fabrication process, portions of rails act as substrates 28 upon which sensor layers 18 are deposited (col. 3, lines 56-58). Since the rails are formed on the ABS (Fig. 2), inherently, it is expected that the ABS be configured prior to the deposition process. As shown in Fig. 1, the plane of the transducers is oriented along the ABS (not the trailing edge). (The numerals A-B have been added by the Examiner, see attachment to the Office Action).

Boutaghou does not explicitly disclose conductive pads extending to the top of the glider, as stated in claim 6 and other limitations of claims 5, 9-10, 13, 16, 18-19, 21 and 26.

With respect to the particular location of the conductive pads and the transducers as stated in claims 6 and 10 respectively: it would have been obvious to one having ordinary skill in the art at the time the invention was made to relocate the conductive pads and transducers disclosed by Boutaghou (col. 3, lines 37-38), since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

With respect to the particular size of the transducers (how far it extends on the slider) as stated in claims 9 and 10: the particular size of the transducers, absent any criticality, is only

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considered to be the "optimum" size of the transducers in the device disclosed by Boutaghou that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the size of the device, etc. In re Boesch, 205 USPQ 215 (CCPA 1980).

With respect to the particular location of the conductive strips, i.e., in the recessed bearing surface on the ABS, as stated in claim 13: it would have been obvious to one having ordinary skill in the art at the time the invention was made to relocate the conductive strips disclosed by Boutaghou (col. 3, lines 37-38), since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to place the conductive strips of the device disclosed by Boutaghou in to the recessed bearing surface so as to prevent their accidental touching of the surface of a disk whose thermal asperity is to be detected.

With respect to claim 16: the method steps will be met during the normal manufacturing of the device stated above.

With respect to claims 18 and 21: having sliced a plurality of heads (bodies) from the wafer, absent any criticality, is only considered to be an obvious modification of the method disclosed by Boutaghou. While the addition of multiple heads to the concept of Boutaghou undoubtedly make the method more useful and productive, it is not the type of innovation for which a patent monopoly is to be granted. See in re St. Regis Paper Co. v. Bemis Co. Inc., 193 USPQ 8, 11 (7th Cir. 1977).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Boutaghou so as to slice a plurality of glide bodies from a substrate in order to decrease manufacturing costs.

With respect to claim 26: having deposited the transducers onto a surface of a wafer prior to slicing the wafer, absent any criticality, is only considered to be the "optimum" or "preferred" method to deposit transducers that a person having ordinary skill in the art at the time the invention was made would have found obvious to provide when making the device disclosed by Boutaghou using routine experimentation based, among other things, on the manufacturing costs involved, etc. See In re Boesch, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to deposit the thermal transducers disclosed by Boutaghou onto the wafer prior to slicing the wafer so as the user could position the transducers at any desirable way and see exactly where to slice.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2, 4-6, 9-11, 13-16, 18, 21 and 26 above, and further in view of Kennedy et al. [hereinafter Kennedy].

Boutaghou discloses the device as stated above in paragraph 9.

Boutaghou does not disclose the limitations of claim 7.

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Kennedy discloses a device in the field of applicant's endeavor wherein a PZT 70 connected to a signal processing unit 19 with a pair of electrical leads 17 to provide communication between the PZT and a processing circuit.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add leads, as taught by Kennedy, to the device disclosed by Boutaghou, in order to provide an electrical connection, as already suggested by Kennedy, and to make it possible for a user to communicate the signal from the transducer to a signal processing unit at any location.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou as applied to claims 2, 4-6, 9-11, 13-16, 18, 21 and 26 above, and further in view of Flechsig et al. [hereinafter Flechsig].

Boutaghou discloses a device as stated above in paragraphs 9.

Boutaghou does not explicitly disclose grounding of the thermal transducers as stated in claim 12.

Flechsig discloses in Fig. 9 a port 120 to which a sensor 91 is grounded.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to electrically ground transducers disclosed by Boutaghou to a ground port, as taught by Flechsig, in order to stabilize or limit the voltage to ground.

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Official Notice is taken with respect to having a common electrical ground as stated in claim 12 since it is very well known in the art to electrically ground transducers in the same circuitry or device to the same (common) electrical ground conductor in order to minimize the number of lines having "0" potential in the same circuitry and, thus, to minimize noise-to-signal ratio.

12. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou '184 as applied to claims 2, 4-6, 9-11, 18, 21 and 26 in view of Nguyen et al. [hereinafter Nguyen].

Boutaghou discloses the device as stated above in paragraphs 9.

Boutaghou does not explicitly disclose the limitations of claim 20.

Nguyen discloses a device comprising a thin film transducer 28 mounted on a rail 24 mounted on an ABS 23 or 24 (col. 2, lines 36-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the MR sensors in the device disclosed by Boutaghou of a thin film, as taught by Nguyen, so as to decrease weight of the transducers, improve an accuracy and deposition of the transducers onto the surface using a thin film technology.

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boutaghou in view of Ishimaga et al. 6234599 [hereinafter Ishimaga].

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Boutaghou discloses the device as stated above in paragraph 9.

Boutaghou does not disclose the limitations of claim 24.

Ishimaga teaches (col. 30, line 52) a temperature sensor (transducer) covered with a protective layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a protective layer to the transducers disclosed by Boutaghou, as taught by Ishimaga, so as to protect the transducers from undesirable contacts in order to improve an accuracy of the detection.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

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15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

16. Any inquiry concerning this communication should be directed to the examiner Verbitsky whose telephone number is (703) 306-5473.

Any inquiry related to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

September 24, 2001



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

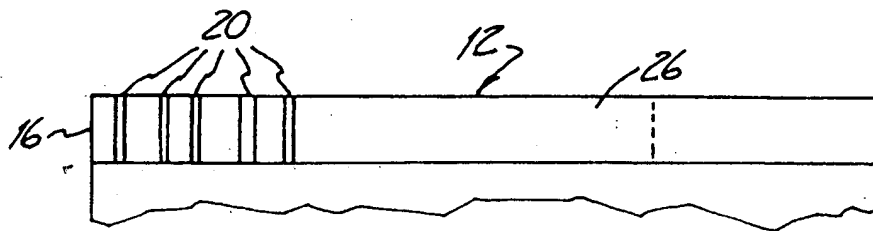


Fig. 11

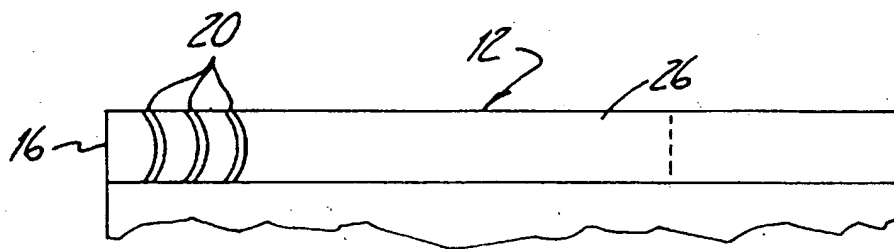
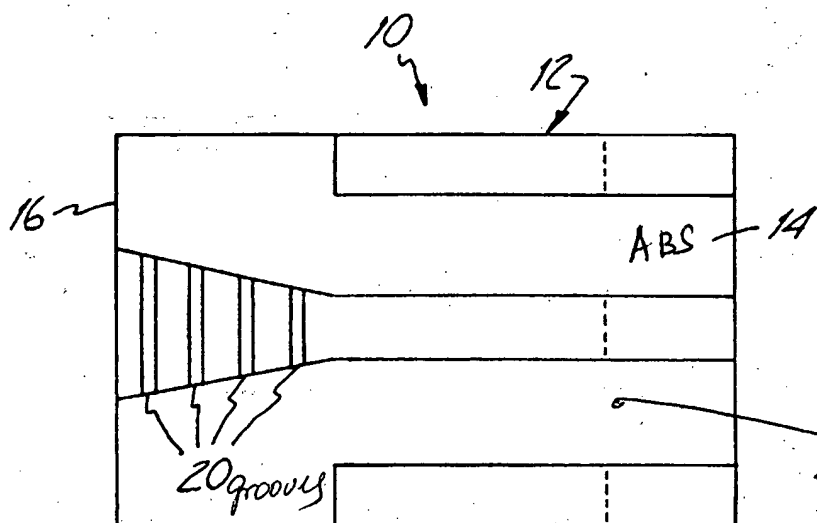


Fig. 12



View from below

Fig. 13

